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Intellectual Property Rights at the National Aeronautics and Space Administration, Lewis Research Center

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National Aeronautics and Space Administration

I. INTRODUCTION:

The National Aeronautic and Space Administration (hereinafter NASA) was chartered in 1958[1] as the premier government agency for the exploration of Space. NASA has had a great deal of success in space exploration and has done a tremendous job of applying these technological advancements here on earth. However, in recent times NASA has had to face new challenges such as tight budget dollars and an ever shrinking appropriations bill. These new challenges are proving to be some of the greatest obstacles that NASA has had to face. With shrinking public support for expensive space missions and the threat of global economic competition, the role of NASA, as well as other federally funded research laboratories, is changing.

Congress has responded to this changing environment by enacting legislation like the Stevenson-Wydler Technology Innovations Act[2] of 1980, and the Bayh-Dole Act[3] of 1982. Both of these bills advocate the transfer of technological innovations from government R&D laboratories to the private sector.[4] The bills combined with "The Memorandum to the Heads of Executive Agencies"[5] facilitate this process by giving the rights in intellectual property developed cooperatively by federal laboratories and private industry to the industry partner. Since the intellectual property rights are transferred to industry under these bills, it is clear that the legislative intent of these bills is to facilitate and support

the commercialization of federally funded endeavors. In other words, as far as Congress in concerned, supporting United States industry, should be one of NASA's primary objectives.

While the legal mechanisms are in place to support United States industries, proper management of NASA's basic resources has to be achieved to implement the legislative intent of Stevenson-Wydler and Bayh-Dole. At the most fundamental level, NASA's corporate knowledge in areas such as aeronautics and space science is its most basic resource. When this basic resource is refined into finished work products, it becomes quantifiable intellectual property. These properties include: patents, copyrights, and other rights associated with the execution of cooperative relationships and the development of new technologies. Therefore, in order to effectively manage NASA's basic resource, its corporate knowledge, proper refinement and management of NASA's intellectual property must occur.

NASA's intellectual property rights are governed by a complex interconnection of laws and regulations. The combination of the diverse intellectual property products and the interconnection of laws that effect NASA make for a management nightmare when attempting to implement the intent of Stevenson-Wydler and Bayh-Dole. This paper endeavors to analyze the current legal mechanisms governing intellectual property at NASA and offers suggestions, where necessary, on how NASA might strategically manage its fundamental resources better. At the outset, the Space Act will be analyzed as the primary source of NASA's intellectual property authority. Patents and copyrights at NASA Lewis will also be assessed as primary

sources of NASA's intellectual property rights. Lastly, the intellectual property rights embodied in Space Act Agreements, procurements, security programs and grants will be assessed for their impact on intellectual property management.

The paper will go on to apply these laws to current joint contractor scenarios that commonly occur in the development of new technology and explain the disposition of rights in a given situation. Where necessary, this paper will advise on the legal arrangement most beneficial in joint technology ventures. Finally, this paper will suggest situations where intellectual property management at NASA can be improved, both for efficiency and for promoting commercialization of federally funded technology.

II. THE CURRENT NASA ENVIRONMENT:

In its early days, NASA concentrated almost exclusively on the advancement of space technology[6]. In addition, the intellectual property rights coming out of the technical developments were maintained by the United States Government. However, as the need to advance the U.S. economy through technological development increased, a series of legislation was passed that promoted cooperative relationships.[7] As a result, the current NASA environment is a cooperative one. Technical projects are accomplished through relationships with industry partners, other government agencies, and universities.

In addition to advocating cooperative relationships as a means of supporting U.S. industry, the transfer of intellectual property rights to the industry partner, university, or non-profit organization has been advocated. To this end, President Ronald Reagan sent directives like the "Memorandum to the Heads of Executive Departments and Agencies"[8] which promoted the transfer of intellectual property rights to the industry partner, university, or non-profit organization. The current NASA environment supports U.S. industry by funding and encouraging cooperative relationships. NASA then empowers industry to commercialize the outcome of the relationship by transferring the intellectual property rights from NASA to the industry, University or non-profit partner.

III. THE SPACE ACT:

There are various laws governing both the cooperative relationships forged by NASA and the disposition of intellectual property rights. The Space Act is the primary authority for defining the disposition of rights in data and inventions patented while under NASA contracts, grants, agreements or using NASA resources in any way.[9]

A) DATA RIGHTS UNDER THE SPACE ACT:

The term "Data" essentially refers to any type of recorded technical information. Under the Space Act, information developed by NASA individually or in a cooperative relationship is made available for public inspection[10] unless withholding the information is required by federal statute[11] or by

another part of the Space Act.[12] In addition, information that involves national security is also withheld under the Space Act.[13]

In the past, the private sector has been concerned about doing joint ventures with NASA because information produced by a private entity, jointly with NASA or by NASA exclusively, would be subject to international disclosure by the Freedom of Information Act.[14] However, this was remedied in 1992 when an amendment to the Space Act[15] provided that data produced in a cooperative relationship,[16] which contained trade secret, commercial or financial information, could be withheld from disclosure for a period of up to five years.[17]

B) PATENT RIGHTS UNDER THE SPACE ACT:

NASA develops inventions independently and jointly with both large and small entities when engaged in a cooperative endeavor. The Space Act provides that NASA may negotiate patent rights with large,[18] but not small, entities.[19]

1. Large entity:

Under the Space Act, inventions developed by a large entity contractor are the exclusive property of the United States[20] Government. However, the Space Act gives the NASA Administrator the power to waive all or part of the rights in the invention.[21]

Each contract entered into with a large entity should contain provisions that require a contracting party to promptly notify NASA of inventions and deliver full and complete

information concerning these inventions.[22] Afterward, the Administrator of NASA may waive his right to all or any part of the invention produced under the contract, retaining for NASA an irrevocable, non-exclusive, non-transferrable, royalty-free license for the practice[23] of the invention throughout the world.[24] In addition, The Administrator is authorized to take any steps necessary to protect an invention or discovery to which he has title and may require that a contractor who has title or a license protect the invention.[25]

In order for NASA to waive its rights in the invention, the large entity has to petition for an "advanced waiver"[26] or a "waiver" after reporting the invention.[27] The NASA Awards and Contributions Board[28] will normally give an advanced waiver to a large entity contractor if the contractor submits a request for waiver prior to execution of the original contract or within 30 days after execution of the contract.[29] The advanced waiver will only apply to inventions which the contractor elects within six months after reporting.[30] However, the granting of an advanced waiver does not relieve the contractor of any reporting requirements contained in the contract.[31] If an advanced waiver is not granted, a large entity contractor can still get a waiver in the invention if the request is received within six months of the disclosure to NASA.[32] If the contractor does petition for an advanced waiver or a waiver after reporting, the Government still retains an irrevocable, non-exclusive, non-transferable,

royalty-free license in the invention.[33] In addition, the Government also retains the right to force the contractor to grant a non-exclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant.[34] Should the Government retain full rights in the patent, the large entity is granted a revocable, non-exclusive, royalty free license in the invention.[35]

2. Small entity:

When working with a small entity, the policy and applicable law for how the Administrator licenses and promotes the commercialization of patentable inventions is contained in what is commonly known as the Bayh-Dole Act.[36] This act superseded the Administrator's authority to regulate the procedures for inventions and data when a small business or non-profit entity is involved.[37]

The general spirit of the Bayh-Dole Act promotes the transfer and quick commercialization of research and development with federal funds by giving title in the invention directly to the small business university or nonprofit organization.[38] There is an assumption here that small business or non-profit entity can commercialize the invention faster than the Federal Agency.

Under Bayh-Dole, the contractor must disclose every invention to the government within a reasonable time and if the contractor does not do so, the Government may receive title to the invention.[39] The contractor must also elect to

retain title within a reasonable time after disclosure and if the contractor does not elect within a reasonable time the Government can take title of the invention.[40] After election, the contractor should file a patent application within a reasonable time and if the contractor does not, the Federal Government should retain title.[41]

If the contractor does pursue a patent, there should be a clause that gives the Government a non-exclusive, non-transferable, irrevocable, paid-up license to practice the invention or have another contractor practice the invention on behalf of the Government.[42] To make sure that the contractor is commercializing the invention properly, the Government requires periodic reporting on utilization or efforts of obtaining utilization by the contractor.[43] In addition, the contractor has to show that the invention was developed under federally funded research by placing a statement in the patent application that the invention was developed under federally funded research.[44]

If the contractor does not elect to retain rights, the Federal Agency can grant a request for the retention of rights by the inventor.[45] When there is joint inventorship,[46] the Federal Agency may not force the contractor to license to any third party, leaving the contractor with the right to promote commercialization.[47] However, the Federal Agency does have the right to require the contractor, an assignee, or licensee to grant a non-exclusive, partially exclusive, or exclusive

license in any field of use to a responsible applicant upon terms that are "reasonable under the circumstances[48]". To further promote the licensing of federal inventions by a small entity, the Bayh-Dole Act requires that a license will not be issued for a federally owned invention unless the prospective licensee submits a plan for marketing and development.[49] Once the plan and license has been submitted, an exclusive or partially exclusive license will be granted after public notice and an opportunity to file written objections is given.[50]

The Code of Federal Regulations (CFR) further defines the Bayh-Dole Act.[51] In general, the CFR requires that the Government use "standard clauses" when establishing contracts.[52] The CFR also includes the "reasonable time" to disclose language of the Bayh-Dole Act. The CFR defines the "reasonable time" to disclose an invention to NASA as two months after the inventor discloses the invention to the contractor.[53] The contractor then has two years from the time of disclosure to the Government to elect to take title.[54] However, if a "statutory bar"[55] has begun, the Agency can force the contractor to elect 60 days before the statutory bar date.[56] Under the CFR, it is expected that the contractor file a patent application within one year after it has elected to retain title.[57]

When looking to license, the Federal Government has a unique advantage over industry because the Government can

grant a license in a federally owned patent for less than all fields of use.[58] However, the Federal Government may not grant an exclusive or partially exclusive license until three months after a notice of the invention's availability has been published in the Federal Register.[59] After a license has been determined to exist, the invention and prospective licensee has to be published in
the Federal Register for a period of 60 days before the license can be granted.[60]

Whether a small or large entity is licensing the invention, a "Bayh-Dole license" is required of the prospective licensee.[61] Licensing under Bayh-Dole requires that the contractor present a marketing plan to the Government, detailing where and how the invention will be produced, manufactured and distributed.[62] This sometimes serves as a deterrent to many prospective licensees who were familiar with the two or three page "Space Act license[63]". The extensive Bayh-Dole license may, ironically, serve as a deterrent to quick commercialization.

IV. PATENT:

Patents are a large part of the intellectual property inventory at NASA. The Agency receives from its engineers and research staff in the area of 1000 disclosures and files approximately 250 of these as patent applications with the Patent and Trademark Office (PTO). The number of disclosures

and patents filed results in approximately 150 patents granted by the PTO in a given year.[64]

A patent may be issued to any machine, composition of matter, article of manufacture, process or improvement of a process.[65] However, laws of nature,[66] chemical formulas "without more[67]",systems of bookkeeping, fundamental truths, original causes, motions or methods of calculations are not patentable.[68]

In addition, a patent has to be new[69] and cannot be "obvious[70]". In determining obviousness, the standard developed through case law[71] assesses the scope of the prior art and the invention disclosed and then determines if one skilled in the art would be able to go from the prior art to the disclosed invention.[72] If a person can go from prior art to disclosed invention, the disclosure will be deemed "obvious" and a patent will not be issued.

NASA patent rights are not only found as a result of NASA patented inventions but also exist in inventions developed under contracts and grants. In each of these legal instruments the NASA patent rights policy is consistent with federal research laboratory policy for small business[73] since NASA gives the intellectual property rights to the small business. As a result, NASA encourages commercialization and promotes society as a whole by funding work that develops into a patentable item.

V. COPYRIGHT:

Copyright and the right to use copyrighted work is another component of NASA's intellectual property inventory. Copyright protection may exist in any expression of an idea when that expression is attached to a tangible medium.[74] This protection does not extend to the idea embodied in the work but the expression of that idea on the tangible medium.[75] At NASA, copyrights come from clauses in grants, space act agreements, procurement and other assorted contracts.[76] Intellectual property rights are also acquired through copyright when work is co-authored between a NASA employee and a contractor,[77] when the contributions are inseparable.

The classes of copyright protection include literary works, graphic works, audiovisuals, sound recordings, and computer software[78]. NASA publications, raw technical data and computer codes, fall within the statutorily prescribed areas of copyright[79] However, copyright protection is not available for the types of government works[80]. Notwithstanding this, government copyrights and licenses attained under grant, contract and inseparable joint works[81] are a major part of the NASA Lewis intellectual property inventory.

VI. SPACE ACT AGREEMENTS:

NASA enters into many contracts, often called "Space Act agreements," because their authority comes from section 203(c) of the Space Act2[83]. The agreement mechanism is used when a NASA joint relationship requires a commitment of NASA resources such as time, effort, personnel, etc.[84] The patent and

data rights clauses in these agreements, serve as a major source of intellectual property[85] for NASA.

Space Act agreements are separated into three prescribed categories:

1. Interagency agreements, which are entered into between NASA and another government agency;[86]
2. College/University agreements, which are entered into between NASA and a College/University,[87] and
3. Space Act agreements,[88] which are entered into when NASA and a private entity contract.

In addition to these designations, NASA agreements are also distinguished as reimbursable or non-reimbursable. A reimbursable agreement is one in which money flows between the agreement's partner and NASA[89], while in a non-reimbursable agreement there is no transfer of funds[90].

Within the variations of reimbursable, non-reimbursable, Interagency, College/University and Space Act agreements, a set of defined standard clauses have been developed by NASA for use during contract execution[91]. These standard clauses carry detailed information about the intellectual property ownership and rights involved in these Space Act agreement relationships. Meaningful distinctions with respect to intellectual property rights engendered in the standard clauses are based on whether the agreement is reimbursable or non-reimbursable.

A. REIMBURSABLE

(1) Rights in Data

Reimbursable Space Act agreements involve the transfer of funds from the agreement's partner to NASA.[92] As such, the rights in data clause used under a reimbursable agreement normally vests the intellectual property rights to the data with the agreement's partner.[93]

The "rights in data clause" of a reimbursable Space Act agreement generally promotes the exchange of data without restrictions to its disclosure, use, or duplication.[94] However, data that was first produced by the agreement's partner or by NASA that contains trade secrets or commercial or financial information will not be disclosed but only used by NASA and its support contractors to carry out the terms of the agreement.[95] If the request is made by the agreement's partner, the proprietary data will also be returned or disposed of at the completion of the activity.[96] In addition, if any exchanged data discloses an invention, the "rights in data" clause provides that NASA and the agreement partner will keep the data secret, normally for one year, so that patent protection is not precluded by a statutory bar.[97]

When data is exchanged with a "notice of copyright" it is assumed that there is a paid-up license between NASA and the participant to reproduce, distribute, and prepare derivative works in fulfillment of the terms of the agreement.[98] In the alternative, if the data does not have a notice of copyright[99] it will be assumed that the data was first produced under the

agreement and therefore could still be reproduced, distributed, or have derivative works made.[100]

(2) Patent and Invention Rights

In general, patent and invention rights of NASA and the agreement's partner remain with the inventing party and no rights are exchanged except as provided by the parties to the agreement.[101] However, with NASA inventions, NASA attempts to make reasonable efforts in reporting inventions and grants the participant the first option to acquire an exclusive, irrevocable, royalty-free license.[102] If a NASA support service contractor makes an invention and if NASA has the right to acquire title, NASA will grant the agreement partner the first option in acquiring an exclusive, irrevocable, royalty-free license.[103] On inventions jointly made between NASA and the agreement partner, NASA will take one of two options:

> In any undivided interest that NASA has acquired or has a right to acquire NASA will grant the participant first option to an exclusive irrevocable, royalty-free license...[or] NASA may agree to refrain from exercising its undivided interest in a manner inconsistent with the [agreement partner's] commercial interest and to cooperate with the [agreement partner] in obtaining patent protection on its undivided interest.[104]

Irrespective of which scenario occurs, the United States Government, including any agencies thereof, will reserve an irrevocable, royalty-free right to practice or have the inventions practiced.[105] In the case where the invention is made solely or jointly with a support service contractor,

there will be a revocable, non-exclusive royalty free license given to the contractor.[106]

B. NON-REIMBURSABLE

(1) Rights in Data

Non-reimbursable agreements do not transfer funds between the agreement's partner and NASA.[107] As a result, intellectual property rights to the data is usually vested in NASA.[108]

Under a non-reimbursable agreement, data should be exchanged between NASA and the agreement partner without any restrictions as to use or duplication.[109] Any data which is produced by the agreement partner outside the terms of the agreement which embodies trade secrets or compromises commercial privilege can be protected by the Government for a period of up to five years. After this the Government can use the data for whatever purpose it desires.[110] If any data discloses an invention, the receiving party promises to hold the data for a reasonable length of time, usually one year, so that patent protection can be pursued.[111] If data is received with copyright notice it will be assumed that it was first produced outside of this agreement and the receiving party will have a paid up license to reproduce, distribute, or prepare derivative works under the terms of this contract.[112] If the data does not have a copyright notice or legend it will be assumed that it was first produced under the agreement, thereby giving NASA an ownership interest in the data. In the latter case, the receiving party will still have the right to reproduce, distribute and prepare derivative works.[113]

(2) PATENT AND INVENTION RIGHTS

When a non-reimbursable agreement produces inventions or patentable items, the agreement's partner and NASA usually agree to retain title to their respective inventions.[114] However, when NASA produces an invention under the agreement, the agreement partner is given the first option to receive either an exclusive or partially exclusive, revocable, royalty-bearing license.[115] Should a NASA support service contractor produce an invention, the agreement partner is given the first option to receive an exclusive, revocable, royalty-bearing license.[116] In the case of a joint inventions NASA will either

> grant [the agreement partner the] first option to an exclusive or partially exclusive, revocable, royalty-bearing license in any undivided interest NASA has the right to acquire or has acquired in such inventions.....or NASA may agree to refrain from exercising its undivided interest in a manner inconsistent with the participant's commercial interests.[117]

Irrespective of whether the Government or the agreement partner produces the invention, the Government reserves the right to an irrevocable, royalty-free license.[118] If the invention is produced by a support service contractor, the contractor has a right to a revocable, nonexclusive, royalty-free license.[119]

VII. PROCUREMENT:

In an attempt to create a fair market place, the Government, when buying goods and services, does so through a "procurement[120]". Procurement is a procedure in which the Government advertises and allows prospective contractors to

bid to meet the Government requirement of goods and services. Research and development procurements are a major source of NASA intellectual property rights.

A. PATENT AND INVENTION RIGHTS:

NASA policy with respect to inventions produced under a procurement contract is based on section 305 of the Space Act of 1958,[121] "Presidential Memo of Patent Policy to the Head of Executive Department of Agencies[122]", and Executive order 12591.[123] In addition, the Federal Acquisition Regulation (FAR)[124] and the NASA Federal Acquisition Regulation Supplement[125] (NASA FAR Supp.) serve as the primary sources of authority for procedural legal direction.

Patent and invention rights acquired through the clauses in procurement contracts are based on whether there is a large or small entity, University or non-profit organization involved. Under a procurement contract, NASA retains title to any inventions made by a large entity unless title has been waived.[126] Therefore, any NASA procurement contracts with big business are required to contain the "New Technology Clause[127]". The new technology clause vests rights in NASA, but offers the contractor the opportunity to attain rights in an invention if they petition for a waiver.[128]

When research and development goods and services are procured from a small business or non-profit organization, the patent rights "contractor retention of rights"[129] clause should be used in the contract. This clause vests rights to

the invention with the contractor, giving them the opportunity to elect to take title[130] and commercialize the invention.

B. RIGHTS IN DATA:

Regardless of whether the contractor is a large or small business, the "data general clause" is used in most procurement contracts.[131] NASA receives both "unlimited Rights" and "limited Rights" to data, under the terms of these contracts.

"Unlimited rights" allows the Government to use the data for whatever purpose that the Government deems necessary.[132] The data general clause gives NASA "unlimited rights" in data first produced under the contract[133], form, fit and function data delivered under the contract,[134] instructional data such as manuals[135] and all other data delivered under the contract[136]. "Limited rights" data by its definition has a limited purpose, therefore, it can only be used by the Government and its contractors for the limited government purpose of the procurement.[137] The data general clause gives NASA "limited rights" to data developed at the contractor's expense that contain trade secrets, confidential information, or restricted computer software and pertains to items, components, or processes developed at private expense.[138]

These provisions are all part of the standard, "rights in data general" clause.[139] However, NASA has at its disposal several alternatives to the standard "rights in data general" clause, that give NASA varying degrees of control over data

produced under a procurement contract. When Alternate I is used, all the contractor has to do to prove that the data should be "limited rights" data is to show that the data was developed at private expense and embody a trade secret or are commercial or financial and confidential and privileged.[140] This clause removes the requirement that the data pertain to items, components, or processes developed at private expense, thereby relaxing the requirements of the standard "rights in data general" clause. When Alternate II is used NASA can require the contractor to deliver "limited rights" data[141] as part of the deliverables of the contract. Alternate III allows the government to require the delivery of restricted computer software under the contract.[142] Under Alternate IV, the contractor is given general permission to establish a claim to copyrighted material made under the contract.[143] The right to copyright is not in the standard clause; usually the contractor has to get the permission of the procurement officer[144] to copyright any data generated under the contract.[145] Lastly, Alternate V enables NASA to go into the contractor facility and inspect any data produced under the contract.[146]

In addition to the general data rights clause the "special works" clause can be used when the primary mission of the contract is to produce or compile data.[147] The "special works" clause gives the Government a great deal of leverage because it allows the Government to copyright the data pro-

duced under the contract.[148] NASA can also gain rights to existing data other than limited rights data[149] and commercial computer software[150] by using some of the other clauses in government procurement arsenal.

VIII. SECURED DATA:

NASA has a range of intellectual property rights in raw data that is placed under varying types of security or privacy constraints. Three particular constraints that are worthy of note are the Export Administration Act[151](EAA), The Export Arms Control Act[152] (EACA), and The Limited Exclusive Rights in Data (LERD) Clause,[153] found in NASA agreements.

The Export Administration Act is enforced by the Department of Commerce through The Export Administration Regulation (EAR).[154] The Export Arms Control Act is administered through the department of State and is implemented through The International Traffic and Arms Regulation (ITAR).[155] Lastly, the Limited Exclusive Rights in Data clause is a special construct of NASA based on the amendment to the Space Act which allows NASA to keep government generated data free from public disclosure for as many as five years.[156]

The Export Arms Regulation contains a commodity control list (CCL)[157] which is a very specific listing of those technologies that the Department of Commerce believes would be detrimental to United States industry if they were exported to foreign countries. The International Traffic and Arms Regulation has a munitions list[158] which details broad categories of

technologies that the Department of State believes would be detrimental to U.S. industry if they were exported.[159] Both regulations look to safeguard the information on their respective lists from foreign nationals,[160] with the former being directed toward U.S. economic strength and the latter being directed toward U.S. military strength.

However, these two regulations can be constraining. Both EAR and ITAR put an independent obligation on the bearer of the information not to export the information. To this end monetary fines and time in jail are doled out[161] to encourage compliance. Most information bearers comply with these rules once they are aware of them. However, what most information bearers are not aware of is that if they discuss any ITAR or EAR information with a non-national, it constitutes and export in the eyes of the law.[162] This occurs even if the non-national is located at Lewis or has been working for a private entity or university for several years. So when NASA works with private partners who are either multi-national corporations or employ foreign nationals, a high potential for the export of restricted information arises.

The LERD data clause is a NASA developed clause directed at achieving some of the same purposes as the Export Administration Act and the Export Arms Control Act, which is to keep information within the technical boundaries of the United States.[163] The LERD clause takes the intent of the acts even a step further by keeping the data within a select group of

partners or contributors.[164] In addition to the clause being placed in NASA contracts, a technology control handbook is usually produced to give a contractor affirmative notice of the conduct expected when the LERD clause is in use.[165]

In general, the LERD clause gives NASA unlimited rights in data first produced and delivered under the terms of this contract except for data denoted as "limited rights" data or "limited exclusive rights" data.[166] Therefore, the contractor has the right to use the LERD data in fulfilling the terms of the contract.[167] Under LERD the contractor can, without the contracting officer's prior approval, copyright any article written using the data produced under the contract.[168] However, the contracting officer's permission is required for the copyright of all other data produced under the terms of the contract.[169] If the contractor is given permission by the Government to copyright the data, the Government is given a paid-up, non-exclusive, irrevocable license in the copyrighted work.[170]

Essentially the thrust of the LERD provision is that the contractor and government shall keep the LERD data in a secure manner sharing it amongst participants who are party to the contract. However, the only recourse that NASA has if a LERD agreement's partner violates the clause is to remove them from the group. Therefore, depending on the worth of the data, LERD will be a strong clause because punishment for its violation is viewed as being great, or LERD will be a weak security

mechanism because the data has very little worth.

IX. GRANTS:

In an attempt to stimulate scientific research, federal agencies in general, and NASA in particular, offer grants to non-profit institutions.[171] The invention and data rights clauses in these grants serve as a source of NASA intellectual property rights.

NASA often sponsors grants to non-profit institutions for the development of research.[172] Grant money can be made available for research in scientific areas when NASA wants to provide latitude for creativity, reduce administration,[173] or NASA itself does not expect to do any substantial research in a given technical area.[174]

When NASA sponsors a grant, the procurement mechanism is used to receive both solicited and unsolicited grant proposals.[175] However, a grant differs from a research and development procurement in that the grant proposal is usually very theoretical in nature.[176] In addition, NASA cannot precisely define the process for achieving the objective.[177] In other words NASA cannot actively direct the work effort under a grant in the same way that it can under a research and development procurement. The patent and data rights in a grant are usually handled in the same way that they would be with any small business or university and that is under the Bayh-Dole Act.[178] By giving the rights to the grantee it is assumed that the grantee will more swiftly commercialize the technology. In addition to the standard grants, NASA

also participates in the Small Business Innovative Research (SBIR)[179] program, which is a federal program directed at stimulating the small business entrepreneur in scientific endeavors. As with the standard grant clauses, the SBIR clauses are directed toward giving the small entity the largest latitude possible with respect to patent and data rights developed under the grant. Therefore, most patent and data rights are vested in the grantee.

X. MANAGEMENT:

NASA's primary objective is space exploration. NASA meets its objective by meeting smaller, more narrowly defined business objectives. However, to meet the various business objectives that are required for NASA's operation, intellectual property management is required. Once the rights engendered in the respective intellectual property sources have been identified, an analysis can be made of how to use these rights and legal instruments/constraints for program implementation, technology transfer or security.

XI. MANAGEMENT FOR TECHNICAL PROGRAM IMPLEMENTATION:

To implement a technical program often requires a multitude of interrelationships. There are often deadlines with industry partners, relationships with support service contractors, and assistance in some parts of the theoretical work by a university. Therefore, to implement the average NASA technical program usually requires some form of support service relationship, an industry relationship, and an academ-

ic relationship. Each of these relationships uses a specific legal instrument to memorialize the relationship and each of the legal instruments carries intellectual property implications for NASA.

In a technical program at NASA Lewis, the industry relationship may be memorialized between NASA and an industry partner under a Space Act agreement. The support service relationship will be memorialized in a contract after the procurement mechanism has been used to procure the support service contractor. The contract that flows out of the procurement will define the intellectual property rights between NASA and the support service contractor. In addition to the support service contractor, a University will probably be used to analyze the more theoretical aspects of the problem. The university relationship will normally be established through a grant. Each of these concurrent relationships carries implications with respect to the intellectual property rights.

CONTRACTOR RELATIONSHIP:

The relationship between NASA and its support service contractor will be governed by a procurement. If the contractor is a large entity the "new technology clause" will be used. The "new technology" clause gives NASA the title and interest in the invention. However, NASA can waive its rights to the invention subject to the waiver of rights provision of the Space Act, as promulgated in the Code of Federal Regula-

tions.

The standard procurement with a small entity uses the "patent rights retention by contractor" clause. If the "patent rights retention by contractor" clause is used, the rights to any invention are vested in the contractor. In other words, the small entity contractor can elect in writing to retain any invention produced under the contract.

With respect to data produced under the contract, the Government has an unlimited right to use data first produced under the contract, form fit and function data delivered, any instructional data, such as manuals, and any other data delivered under the contract. NASA will also have limited rights in computer software, data developed with private funds, or data that encompasses trade secret or confidential information.

INDUSTRY RELATIONSHIP:

The agreement struck between NASA and the industry partner will usually be memorialized in a Space Act agreement. If it is reimbursable the rule of thumb is that the participant will get the first option to an exclusive, irrevocable, royalty-free license of NASA's interest in the invention, whether it is a NASA invention, a NASA contractor invention, or a joint invention with the participant. Should there be a nonreimbursable agreement, NASA will give the contractor the right to have an exclusive or partially exclusive, revocable, royalty-bearing license in NASA's undivided interest if the invention is a NASA invention, NASA contractor invention, or joint invention with the contractor. In any case, NASA retains an irrevocable royalty free right of use in the invention.

With respect to the rights in data under a Space Act agreement, in a reimbursable Space Act agreement, NASA will keep all data proprietary and return the data to the contractor if required. In a non-reimbursable agreement, NASA will keep the data secret for a period, not to exceed five years.

ACADEMIC RELATIONSHIP:

NASA will have some of the theoretical aspects of the program done by giving a grant to a university. As far as the patent and data rights are concerned, a university is considered a non-profit organization, therefore they would fall under the provisions of the Bayh-Dole Act which would vest

rights to any invention or data in the university.

INDUSTRY ANALYSIS:

When the patent rights are analyzed on a joint endeavor between NASA a contractor and a Space Act partner, it quickly becomes apparent that in the case where there is a large entity contractor there is no problem, (because the new technology clause is used) and NASA owns the rights to the invention. Therefore, NASA can transfer its rights in the invention over to the Space Act agreement's partner. However, when there is a small entity contractor, the small entity can elect to retain title to the invention. If a Space Act agreement partner is also a party to the invention, then the participant would get the right to a royalty-free or royalty-bearing license depending on whether the invention is non-reimbursable or reimbursable, respectively, in any undivided interest that NASA has the right to transfer. However, if there is a small entity contractor that elects to take title, the participant will not get any interest in the invention because NASA will not have any interest in the invention. This may serve as a deterrent for an agreement partner who would like to acquire all the rights to the invention.

A similar analysis can be made for data rights. When data is produced between the Space Act agreement partner, NASA, and the contractor, there is usually no problem because NASA has unlimited use of the data for government purposes, and a Space Act agreement would be a government purpose. In

addition, NASA would be able to keep proprietary data secret for at least five years with a non-reimbursable agreement or keep it secretly indefinitely if the data is used in a reimbursable agreement.

ACADEMIC ANALYSIS:

If we now switch the situation to where there is a NASA contractor working on the project and there is a grant with a grantee, a different analysis arises. In this situation you have two procurements, one for continuous support from the support service contractor and another for a specific research objective with the grantee. There is a potential problem with the patent rights if you have a small entity contractor and a grantee. However, this problem is avoided if the grantee is truly doing work that should be done in a grant, meaning, that there is very little if any involvement from NASA and there would not be any joint inventions.

In the case of data generated under this scenario, the Government would have the right to unlimited use of data produced by either the contractor or the grantee, so all parties would be protected and the data would be available for sharing.

XII. MANAGEMENT FOR TECHNOLOGY TRANSFER:

Another business objective of NASA is the transfer of technology. This objective comes directly from Congress, which has mandated through a series of legislative enactments that technology transfer should be a high priority for NASA

Lewis. Legislation like the Stevenson-Wydler Act, The Federal Technology Transfer Act, Technology Competitiveness Act, National Competitiveness Technology Transfer Act, Bayh-Dole Act, Small Business Innovation Development Act and The Small Business and Reauthorization Administration and Amendment Act, all lead toward encouraging greater transfer of the NASA Lewis technology to a private or non-profit entity.

For purposes of this discussion we can categorize NASA technology into distinct areas, such as "know how," "computer codes," "patentable material," and "raw data." Transfer of each of these types of technology can be accomplished by using different legal and management tools. For example, the transfer of know how can be accomplished through consortia, the transfer of computer codes may be accomplished through a procurement intermixed with workshops, the transfer of patentable subject matter may occur with a licensing agreement, and the transfer of raw data may be accomplished through industrial partnerships.

When technology is transferred to an entity outside of the Government or technology transfer occurs through a joint development project, the rights to intellectual property becomes a key issue. Each of the transfer tools such as consortia, procurements, licensing or industrial partnerships has legal ramifications with respect to the intellectual property rights.

ANALYSIS:

One of the primary mechanisms for transferring know how is a consortia. Through a consortia several key companies can get involved in expensive research relevant to each company at a greatly reduced cost. One way of legally structuring a consortia is by establishing a non-reimbursable Space Act agreement with each company or conversely establishing a Space Act agreement which names each consortia member as a party.

The non-reimbursable agreement has appeal in this scenario because in the case of patent rights, a partially exclusive, revocable, royalty bearing license can be given for joint inventions between NASA and the consortia member. In addition, the non-reimbursable agreement gives NASA the option of licensing an invention to as many consortia members as is required. The non-reimbursable agreement also gives NASA the right to revoke the license, should a consortia member be lax in promoting the invention. Therefore, by using the non-reimbursable agreement in this scenario, the Government has control as it promotes the invention through a license.

Data developed under a Space Act agreement can be kept reserved for at least five years and for as long as necessary if the data involves trade secret or commercially sensitive data. Therefore, data developed in the consortia is offered a significant amount of protection from disclosure, thereby enabling the consortia members to get a commercial jump on the marketplace and consequently, advancing U.S. industry.

Computer programs can potentially be transferred through

a procurement mechanism that involves workshops. The reason this is done is that the Government cannot copyright government developed computer programs, therefore one of the ways that the Government can protect, maintain and control the dissemination of computer programs is through the procurement process. This transfer scenario would be accomplished by either using the data general clause with Alternate V, the special works clause or the commercial computer software clause, which would allow the Government to protect the computer code by copyright.

In addition to the copyright problem, there is the issue of disseminating the code amongst various companies in a timely fashion. This is a significant issue in the computer arena since computer codes become obsolete quickly. Add to this a requirement of NASA input on the software and the problem develops of managing an iterative loop between the contractor and NASA which moves time sensitive information back and forth. Procuring the computer software and then coupling the procurement with workshops is one potential solution to this problem. Procuring the software services would allow NASA to legally protect the software by copyrighting it. Coupling the procurement with regularly scheduled workshops would enable the quick transfer of information between NASA and the contractors, thereby facilitating the iterative loop that helps the development of the software.

Inventive technology can usually be patented and then

transferred via a patent license. NASA can negotiate an exclusive or partially exclusive license with any company after placing the information in the federal register for three months after notice of the invention's availability. Once a prospective licensee is identified, a notice of the prospective licensee (identifying the invention) and the prospective licensee is also placed in the federal register.

Lastly, raw data can potentially be transferred through an industry partnership. One of the legal mechanisms used for establishing an industry partnership is a Space Act agreement, therefore the various intellectual property rights, discussed under the Space Act agreement portion of this paper, accrue.

XIII. MANAGEMENT FOR SECURITY:

With the rise of the global marketplace, the position of the United States may well depend on NASA's ability to help U.S. industry. While industry strongly advocates having this support for research and development, they want to do so while maintaining the security of their intellectual property. Therefore, security and commercial sensitivity have arisen as significant management objectives for NASA. Without assurities of security, many U.S. companies will refuse to do business with the Government, fearing disclosure of their research and development efforts to global competitors.

For this analysis let us assume that NASA has relationships with U.S. partners and these partners are interested in working together in a research and development relationship.

The partners however, would like to keep the technical work done in this relationship contained in the United States for United States industry, but do not want to be bound to the point that they can not use the technology as a negotiating point with foreign competitors at a later date. In addition, because foreigners can use the Freedom of Information Act (FOIA) to request information from the Government, U.S. industry is requesting legal mechanisms that are FOIA resistant thereby protecting commercially sensitive intellectual property.

ANALYSIS:

When attempting to protect commercially sensitive data it quickly becomes clear that legal mechanisms are lacking. ITAR and EAR at first glance seem to offer the levels of protection that U.S. industry partner may want, because they both keep the information away from foreigners. However, there are licensing procedures involved in transporting data when using ITAR or EAR. This causes several problems. With the large amount of foreign nationals doing research for American companies in the United States, many of the experts in these companies would not be able to have access to the data, because giving them access would be considered an export. Secondly, with the multinational flavor of companies in this country it is foreseeable that using ITAR and EAR would stop data from flowing between different areas within the same company. In addition, when a U.S. company wants to take this

technology to a foreign competitor for business negotiations, there once again will be the licensing requirements. Lastly, ITAR or EAR are not mechanisms that can be controlled; each of them places an obligation on the information bearer to secure the data.

In order for a technology to be categorized as ITAR or EAR the technology has to be located on the munitions list for ITAR or the commodity control list for EAR. The decisions of which technologies are maintained on these lists are determined by the State Department and the Commerce Department, respectively. Therefore, the only decision that can be made with respect to either of these legal protections is whether the technology that is being used falls on one of these lists or not. If the technology that NASA or the U.S. partner is using does fall on the list, NASA and the U.S. partner has the independent obligation to protect against the transfer of this data to foreign competitors. Therefore, it is incumbent on NASA not to misrepresent to contractors, agreements partners or university associates that the Agency is going to place their technology under ITAR or EAR.

A NASA developed solution to the limited scope and inflexibility of ITAR and EAR is the NASA Limited Exclusive Rights in Data (LERD) clause. LERD was developed to manage the problem of a government agency handling commercial sensitive data without having to disclose the data to FOIA request.

However, like any legal constraint, LERD is only as good as the ability to enforce the clause. Therefore a technology control guide was developed in conjunction with the clause to make the U.S. partners aware of the conduct that is expected when under a contract using the LERD clause.

The LERD clause and its companion document (the technology control guide) vest the rights to the data with the Government so the data can easily be shared with the industry partners. The technology control guide outlines the specific intellectual property that the clause is meant to protect, thereby giving all U.S. participants affirmative notice of the technology that is being protected.

The LERD clause defines "Limited exclusive rights," "Limited exclusive rights data" and "Limited rights." The "Limited exclusive rights," designation gives the Government the right to use the data produced under this contract for government purposed and gives the contractor the right to use this data anywhere within the United States for its own purposes. "Limited exclusive rights data" is defined as data first produced under this contract and specifically identified in this contract as subject to limited rights. Lastly, "Limited rights" is used to define data that is developed at private expense which contains trade secret, commercial or financial information. The designations of Limited Exclusive Rights, Limited Exclusive Rights Data, and Limited Rights designates the intellectual property right that NASA has in

the data. The different designations and labeling of the data also gives affirmative notice to a party handling the data of the level of security of the data. Should the community of U.S. participants decide that they later want to use the data for a negotiation with a foreign entity, all that is required is that the group designate the information as "unlimited data" which would allow the data to be disclosed to the public.

In addition, because LERD is based on the amendment to the Space Act, the data is resistant to FOIA. As a legal mechanism, LERD is broad in its scope. The clause enables NASA to put different levels of security on any type of data that may flow out of the contract. LERD is also flexible; by

changing the data to "unlimited data," the data is available for negotiations when a U.S partner is negotiating with a foreign entity.

XIV. POTENTIAL CHANGES FOR NASA:

In general, intellectual property has gained more prominence in the world market place. Intellectual property is the NASA work product and is at the heart of what NASA, as the national space agency, has to offer the United States public. Therefore, it is incumbent on NASA to effectively manage its intellectual property to meet its goals. There are however, some aspects of intellectual property management that need to be changed.

The foregoing discussion has assessed the basic mechanisms that engender intellectual property rights for NASA. This analysis however, would change if some of the fundamental intellectual property tools were to change. For example, there is a need for some change in both the patent procedures and computer copyright procedures at NASA Lewis.

The current NASA mechanism for prosecuting patents is a reactive one, done without any strategic planning. Thoughts of patenting in the current NASA environment often come into play after the program has been accomplished, after an invention has been produced, or possibly after there is a statutory bar.[180]

A more proactive approach needs to be taken in which the patent potential of the technology is assessed when strategic

planning is being done. In addition, if the program gives a grant to a university, contracts with a small business or enters into a Space Act agreement, NASA's patent rights may be lost if careful planning is not done.[181] A policy of assessing the technologies of a program should be put in place so that an application can be pursued by a constructive reduction to practice,[182] thereby precluding any bars or loss of ownership in the invention.

In addition to the patent problems associated with the traditional patentable subject matter,[183] NASA as an agency may need to revisit the patenting of computer software.[184] Although mental steps cannot be patented,[185] The interplay between the mental steps found in a computer code and the physical phenomenon that the code may control has been found to be patentable.[186] With the large amount of NASA intellectual property now being refined into computer code the patenting of computer code may have to be revisited to capture the investment of time and personnel that NASA puts into the development of these codes.

XV. CONCLUSION:

It is clear that supporting U.S. industry has risen as a priority for Federal Research Laboratories. The Executive branch of the government has made this clear through a series of legislative enactments and executive orders. By properly managing intellectual property rights, NASA can serve as a catalyst in the stimulation and commercialization of govern-

ment funded endeavors. Therefore, intellectual property management must play a significant role in the future of NASA. While intellectual property is not the only asset that needs to be effectively managed, it is one of the most important, because it is one of the value adding return that NASA gives the American people for their investment into NASA.

FOOTNOTE

1. 42 U.S.C.A. § 2451 (West 1992).

2. 15 U.S.C.A. §§ 3107-3714 (West 1983).

3. 35 U.S.C.A. § 200 (West 1983).

4. V. W. Wessel, NASA INTELLECTUAL PROPERTY PROGRAMS, PPA 996 Masters Project Paper, November, 1991. (on file with the author).

5. Memorandum from Ronald Reagan to the Heads of Executive Departments and Agencies (February 18, 1993).

6. Virginia P. Dawson, Engines and Innovation; Lewis Laboratory and American Propulsion Technology (1991).

7. Among these statutes were:

Stevenson-Wydler Act, Public Law No. 96-480, 1980, codified at 15 U.S.C.A. §§ 3701-3714 (West 1982). This act was the first attempt to support the transfer of technical innovation from government laboratories to the private sector. The act promoted five initiatives. The Office of Industrial Technology, grants and cooperative agreements were encouraged, Offices of research and technology applications were developed, a Technology Medal, and funded was advocated for the transfer of personnel between the federal laboratory, industry and universities.

Federal Technology Transfer Act, Public Law No. 99-502, 1986, codified at 15 U.S.C. § 3701 et.seq. and 35 U.S.C. § 210. Amended the Stevenson-Wydler Act by allowing center directors to enter into cooperative R&D arrangements and negotiate the licensing. The Act allowed government employees to work on efforts to commercialize inventions. Lastly, the Act established a royalty sharing program.

Technology Competitiveness Act, Public Law No. 100-418, §§ 5101, 1988, codified at 15 U.S.C. § 271. Further amended Stevenson-Wydler by establishing clearinghouses for State and Local Initiatives on Productivity, Technology and Innovation.

National Competitiveness Technology Transfer Act, Public Law No. 101-189, 1989, codified at 15 U.S.C. § 3710, 3710(a) and 3710(c). Further amended Stevenson-Wydler by enabling directors of National Laboratories to take title to and license inventions.

Bayh-Dole Act, Public Law No. 99-502, § 99c), Public Law No. 96-517, 1980, and Public Law No. 98-620, 1984, codified as amended at 35 U.S.C. §§ 200-212. Established a uniform policy for the disposition of patent rights with respect to small businesses, universities or non-profit organizations.

Small Business Innovation Development Act, Public Law No. 97-219, 1982, codified at 15 U.S.C. § 638. Required federal agencies with budgets in excess of one hundred million dollars to establish Small Business Innovative Research Programs (SBIR).

National Superconductivity and Competitiveness Act, Public Law No. 100-697, 1988, codified at 15 U.S.C. §§ 5201-5209. Established a plan for federal agencies to work together in developing high temperature superconducting materials.

Small Business and Reauthorization Administration and Amendment Act, Public Law No. 100-918, 1988, codified at 15 U.S.C. § 631 et seq. Established the Technology Access Program which allows small businesses to access database services that will inform them on new technology.

8. Memorandum from Ronald Reagan to the Heads of Executive Departments and Agencies (February 18, 1993)(on file with author)

9. 42 U.S.C.A. § 2451 (West 1987).

10. 42 U.S.C.A. § 2454(a) (West 1983).

11. 42 U.S.C.A. § 2454(a)(A)(West 1983).

12. 42 U.S.C.A. § 2454(a)(C)(West 1983).

13. 42 U.S.C.A. § 2454 (a)(B)(West 1983).

14. 5 U.S.C.A § 552 (West 1983).

15. Section 303(b) of the Space Act was added by the National Aeronautics and Space Administration Authorization Act, FY93, P.L. 102-588 in section 509, 106 Stat. 5129. It further designates the previous section 303 as section 303(a) and added subsection 303(a)(C).

16. 42 U.S.C.A. § 2473(c)(5)(West 1983).
See Also 42 U.S.C.A. § 2473(c)(6)(West 1983).

17. 42 U.S.C.A. § 2454(b)(West 1992).

This has also encouraged private industry to engage in more joint endeavors with NASA.

18. 42 U.S.C.A. § 2457(f)(West 1982).

19. The "Small Business and University Patent Procedure Act," Public Law 96-517, December 12, 1980, section 7(b), (94 Stat. 3027) deleted subsection(g) which authorized the Administrator of NASA to promulgate regulations for the granting of licenses for NASA patents. Section 8(f) of the Act provided that such deletion was effective on July 1, 1981.

20. 42 U.S.C.A. § 2457(d)(West 1982).

21. 14 C.F.R. § 1245.100 (West 1992).

22. 14 C.F.R. § 1245.105 (1992).

23. 14 C.F.R. §§ 1245.205, 1245.206 (1992)

24. 42 U.S.C.A. § 2457 (West 1983).

25. 14 C.F.R. § 1245.212 (1992).

26. 14 C.F.R. § 1245.104 (1992).

27. 14 C.F.R. § 1245.105 (1992).

28. 42 U.S.C. § 2457(f) (West 1982).

29. 14 C.F.R. § 1245.104 (b)(1992).

30. 14 C.F.R. § 1245.104(c)(2)(1992)

31. 14 C.F.R. § 1245.104(c)(2)(1992).

32. 14 C.F.R. § 1245.105(b)(1)(1992).

33. 14 C.F.R. § 1245.107(a)(1992).

34. 14 C.F.R. § 1245.107(b)(1992).

35. 14 C.F.R. § 1245.107(a)(1992).

36. 35 U.S.C. § 200-212 (West 1983).

37. 42 U.S.C § 2457(g) (West 1992).

38. Id.

39. 35 U.S.C. 202(c)(1) (West 1983).

40. 35 U.S.C. § 202(c)(2) (West 1983).

41. 35 U.S.C. § 202 (c)(3) (West 1983).

42. 35 U.S.C. 202(c)(4) (West 1983).

43. 35 U.S.C. 202(c)(5) (West 1983).

44. 35 U.S.C. § 202(c)(6) (West 1983).

45. 35 U.S.C. § 202(7)(d) (West 1983).

46. 35 U.S.C. § 116 (West 1983).

47. 35 U.S.C. § 202(e) (West 1983).

48. 35 U.S.C. § 203 (West 1983).

49. 35 U.S.C. § 209(a) (West 1983).

50. 35 U.S.C. § 209(b) (West 1983).

51. 37 C.F.R. § 401.1 (1992).

52. 37 C.F.R. § 401.3 (1992).

53. 37 C.F.R. § 401.14 (c)(1)(1992).

54. 37 C.F.R. § 401.14(c)(2)(1992).

55. 35 U.S.C.A. 104(b) (West)

56. 37 C.F.R. § 401.14(c)(2)(1992).

57. 37 C.F.R. § 401.14(c)(3)(1992).

58. 37 C.F.R. § 404.5(d)(2)(1992).

59. 37 C.F.R. § 404.7(a)(1)(1992).

60. 37 C.F.R. § 404(a)(1)(i)(1992).

61. 37 C.F.R. § 404.1 (1992)

62. 37 C.F.R. § 404.5(a)(1)(1992).

63. 42 U.S.C. § 2457(g) (West 1983).

64. George V. Woodling, Inventions and their Protection (The Penton Publishing Co, 1938) 1953.

65. Gustav Drews, The Patent Right In The National Economy of The United States, (Gustav Drews, 1951), 1952.

66. Robert A. Buckles, Inventions, and patents, How to Develop and Protect them, (John Wiley & Sons, Inc. 1957), 1957.

67. Id.

68. Id.

69. Id.

70. Graham v. John Deere, 383 U.S. 1, 148 U.S.P.Q. 459 (1967).

71. Id.

72. Id.

73. 35 U.S.C.A. § 200 (West 1983).

74. 17 U.S.C.A. § 102(a) (West 1983).

75. 17 U.S.C.A. § 102 (West 1983)

76. i.e. Small Business Innovative Research grants, Chiles Act agreements, etc.

77. Letter from Nina Lawrence, Associate General Counsel to NASA Installations Patent Counsel (July 5, 1991) (on file with the author).

78. 17 U.S.C.A. § 102(a) (West 1992).

79. Id.

80. 17 U.S.C.A. §§ 101,105 (West 1983).

81. Letter from Nina Lawrence, Associate General Counsel to NASA Installations Patent Counsel (July 5, 1991) (on file with the authors)

83. 42 U.S.C.A. § 2457 (West 1983).

84. Id.

85. Space Act Agreements Manual, Code G, Office of General Counsel, August 19, 1993.

86. NASA Management Instruction, (NMI 1050.3), December 13, 1991.

87. NASA Management Instruction, (NMI 1050.6), December 13, 1991.

88. NASA Management Instructions (NMI 1050.9A, December 13, 1991.

89. Id.

90. Id.

91. NASA Space Act Agreements Manual, Code G, Office of General Counsel, August 19, 1993, Section II.1.

92. NASA Management Instruction NMI 1050.9A, December 13, 1991.

93. Id.

94. NASA Space Act Agreements Manual, Code G, Office of General Counsel, August 19, 1993, Appendix (I)(E), rights in data - II. General, pa-27.

95. See id. at pA-27; III. participant produced data

96. Id.

97. 35 U.S.C.A. § 102 (West 1983).

98. NASA Space Act Agreements Manual, Code G, Office of General Counsel, August 19, 1993. Appendix(I)(E), Section VI.(1) copyright, pA-28.

99. Id.

100. See id. at VI(2) Copyright.

101. See id. at pA-20;
Section II. - general, patent and invention rights

102. See Id. Section III NASA Inventions; Patent and invention rights (reimbursable).

103. See id. at pA-20; Section IV. NASA Contractor Inventions (patent and invention rights).

104. 14 C.F.R. § 1245.108 (1992).

105. NASA Space Act Agreements Manual, Code G, Office of General Counsel, August 19, 1993. pA-21, Section VI(1)

106. Id at pA-21; Section VI(2).

107. NASA Management Instruction NMI. 1090.9A, December 13, 1991.

108. Id.

109. NASA Space Act Agreements Manual, Code G, Office of General Counsel, August 19, 1993, pA-24, Section. II General.

110. Id at pA-24; Section. III. background data.

111. Id at pA-25;Section VI. data disclosing invention.

112. Id at pA-25; Section. VII copyright (1).

113. Id at pA-25. Section. data rights VII, copyright (2).

114. Id at pA-17.Section II (general) - patent and invention rights.

115. Id at pA-18. Section III NASA Inventions (patent and invention rights).

116. Id at pA-18. Section. IV NASA Contractor Inventions.

117. Id at pA-18; Section V. Joint inventions with participant.

118. Id at pA-18. Section VI. licenses to be reserved in participants license

119. 14. C.F.R. § 1245.108 (1992).

120. 10 U.S.C.A. § 2301 (West 1983).

121. 42 U.S.C.A. § 2457 (West 1983).

122. Memorandum from Ronald Reagan to The Heads of Executive Departments and Agencies (February 18, 1983) (on file with the author).

123. Exec. Order No. 12591 (April 10,1987).

124. The Federal Acquisition Regulation (FAR), (FAC 90 -18), May 28, 1993.

125. The NASA Federal Acquisition Regulation Supplement (NFS), (NFSD 89-12), November 30, 1992.

126. 14 C.F.R. § 1245.105 (1992).

127. 48 C.F.R. § 1827.372(d)(2) (1992).

128. NFS 18-52.227-70, June 30, 1989.

129. 48 C.F.R. § 1827.373(a)(1) (1992). See also FAR 52.227-11, May 28, 1993.

130. FAR 52.227-11, May 28, 1993.

131. FAR 52.227-14. May 28, 1993.

132. Id. at Section (a).

133. Id. at Section (b)(i).

134. Id. at Section (b)(ii).

135. Id at Section (b)(iii).

136. Id at Section (b)(iv).

137. Id.

138. Id.

139. FAR 52.227-14, May 28, 1993.

140. FAR 52.227-14. Alternate I. May 28, 1993.

141. FAR 52.227-14. Alternate 2. May 28, 1993.

142. FAR 52.227-14. Alternate 3. May 28, 1993.

143. FAR 52.227-14. Alternate 4. May 28, 1993.

144. 41 U.S.C § 423 (West 1983).

145. FAR 52.227-14. May 28, 1993.

146. FAR 52.227-14. Alternate V. May 28, 1993.

147. Far 52.227-17. May 28, 1993.

148. Id.

149. FAR 52.227-18, May 29 1993.

150. FAR 52.227-19, May 28, 1993.

151. 50 U.S.C.A. § 2401 (West 1983).

152. 22 U.S.C.A. § 2751 (West 1983).

153.

RIGHTS IN DATA - LIMITED EXCLUSIVE RIGHTS (January 1992)

(a) Definitions.

"Computer software," as used in this clause, means computer programs, computer data bases, and documentation thereof.

"Data," as used in this clause, means recorded information, regardless of form or the media on which it may be recorded. The term includes technical data and computer software. The term does not include information incidental to contract administration, such as financial, administrative, cost or pricing, or management information.

"Form, fit, and function data," as used in this clause, means data relating to items, components, or processes that are sufficient to enable physical and functional interchanges ability, as well as data identifying source, size configuration, mating, and attachment characteristics, functional characteristics, and performance requirements; except that for computer software means data identifying source, functional characteristics, and performance requirements but specifically excludes the source code, algorithm, process, formulate, and flow charts of the software.

"Limited exclusive rights," as used in this clause, means the rights of the Government and others acting on its behalf to use, duplicate and disclose

for Government purposed, the rights of the Contractor to use, duplicate, and disclose for its purposes within the United States, and the rights of other entities designated or approved by the Government to use and duplicate(but not to further disclose) for their purposes within the United States, provided that in all instances the data are made subject to disclosure restrictions that protect and preserve its limited exclusive rights.

"Limited exclusive rights data," as used in this clause, means technical data (including system studies and computer source programs and code) first produced in the performance of this contract that have been specifically identified in this contract(either at the time of contract or subsequently by amendment) as generally known, or such data have not without obligation as to its confidentiality been made available to others by the Contractor or are not already available to the Government. The limited exclusive rights of the Government, the Contract, and other entities regarding the disclosure and use of such data are as set forth in subparagraph (g)(4) of this clause.

"Limited rights," as used in this clause, means the rights of the Government in limited rights data as set forth in the Limited Rights Notice of subparagraph (g)(2) if included in this clause.

"Limited rights data," as used in this clause, means data (other than computer software) developed at private expense that embody trade secret or are commercially or financially and confidential or privileged.
"Restricted computer software," as used in this clause, means computer software developed at private expense and that is a trade secret; is commercial or financial and is confidential or privileged; or is published copyrighted computer software; including minor modifications of such computer software.

"Restricted rights," as used in this clause, means the rights of the Government in restricted computer software, as set forth in a Restricted Rights Notice of subparagraph (g)(3) if included in this clause, or as otherwise may be provided in a collateral agreement incorporated in and made part of this contract, including minor modifications of such computer software.

"Technical data," as used in this clause, means data(other than computer software) which are of a scientific or technical nature.

"Unlimited rights," as used in this clause, means the right of the Government to use, disclose, reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, in any manner and for any purpose, and to have or permit others to do so.

(b) Allocation of rights.

(1) Except as provided in paragraph (c) of this clause regarding copyright, the Government shall have unlimited rights in -

(i)
Data first produced in the performance of this contract unless provided otherwise for limited exclusive rights data in accordance with subparagraph (g)(4) of this clause;

(ii)
Form, fit and function data delivered under this contract;

(iii)
Data delivered under this contract (except for restricted computer software) that constitute manuals or instructional and trading material for installation, operation, or routine maintenance and repair of items, components, or processes delivered or furnished for use under contract; and

(iv)
All other data delivered under this contract unless provided otherwise for limited rights data, restricted computer software, or limited exclusive rights data in accordance with paragraph (g) of this clause.

(2) The Contractor shall have the right to-

(i)
Use, release to others, reproduce, distribute, or publish any data first produced or specifically used by the contractor in the performance of this contract, unless provided otherwise in paragraph (d) of this clause or in subparagraph (g)(4) of this clause;

(ii)
Protect from unauthorized disclosure and use those data which are limited rights data, restricted computer software, or limited exclusive rights data, to the extent provided in paragraph (g) of this clause;

(iii)
Substantiate use of, add or correct limited rights, restricted rights, limited exclusive rights, or copyright notices and to take other appropriate action, in accordance with paragraphs (e) and (f) of this clause; and

(iv)

Establish claim to copyright subsisting in data first produced in the performance of this contract to the extent provided in subparagraph (c)(1) of this clause.

(c) Copyright.

(1)
Data first produced in the performance of this contract.

Unless provided otherwise in paragraph (d) of this clause, the Contractor may establish, without prior approval of the Contracting officer, claim to copyright subsisting in scientific and technical articles based on or containing data first produced in the performance of this contract and published academic, technical or professional journals, symposia proceedings or similar works. The prior, express written permission of the Contracting Officer is required establish claim to copyright subsisting in all other data first produced in the performance of this contract. When claim to copyright is made, the Contractor shall affix the applicable copyright notices of 17 U.S.C. 401 or 402 and acknowledgement of Government sponsorship (including contract number) to the data when such data are delivered to the Government, as well as when the data are published or deposited for registration as a published work in the U.S. Copyright Office. For data other than computer software, the Contractor grants to the Government, and others acting on its behalf, a paid-up, nonexclusive, irrevocable worldwide license in such copyrighted data to reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, by or on behalf of the Government. For computer software, the Contractor grants to the Government and others acting in its behalf, a paid-up nonexclusive, irrevocable worldwide license in such copyrighted computer software to reproduce, prepare derivative works, and perform publicly and display publicly by or on behalf of the Government.

(2) Data not first produced in the performance of this contract.

The Contractor shall not, without prior written permission of the Contracting Officer, incorporate in data delivered under this contract any data not first produced in the performance of this contract any data not first produced in the performance of this contract and which contains the copyright notice of 17 U.S.C. 401 or 402, unless the Contractor identifies such data and grants to the Government, or acquires on its behalf, a license of the same scope as set froth in subparagraph (c)(1) of this clause; provided, however, that if such data are computer software the Government shall acquire a copyright license as set froth in subparagraph (g)(3) of this clause if included in this contract or as otherwise may be provided in a collateral agreement incorporated in or made part of this contract.

(3)
Removal of copyright notices.

The Government agrees not to remove any copyright notices placed on data pursuant to this paragraph (c), and to include such notices on all reproductions of the data.

(d) Release, publication and use of data.

(1)
The Contractor shall have the right to use, release to others, reproduce, distribute, or publish any data first produced or specifically used by the Contractor in the performance of this contract, except to the extent such data may be subject to the Federal export control or national security laws or regulations, or unless otherwise provided in this paragraph, in paragraph (g) of this clause or as expressly set forth in this contract.

(2)
The Contractor agrees that to the extent it receives or is given access to data necessary for the performance of this contract which contain

restrictive markings, the Contractor shall treat the data in accordance with such markings unless otherwise specifically authorized in writing by the Contracting Officer.

(3) The Contractor agrees not to establish claim to copyright or publish or release to others any computer software first produced in the performance of this contract other than pursuant to subparagraph (g)(4) of this clause without the Contracting Officer's prior written permission.

(e) Unauthorized marking of data.

(1) Notwithstanding any other provisions of this contract concerning inspection or acceptance, if any data delivered under this contract are marked with the notices specified in subparagraph (g)(2), (g)(3), or (g)(4) of this clause and use of such is not authorized by this clause, or if such data bears any other restrictive or limiting markings not authorized by this contract, the Contracting Officer may at any time either return the data to the Contractor, or cancel or ignore the markings. However, the following procedures shall apply prior to cancelling or ignoring the markings.

(i) The Contracting officer shall make written inquiry to the Contractor affording the Contractor 30 days from receipt of the inquiry to provide written justification to substantiate the propriety of the markings;

(ii) If the Contractor fails to respond or fails to provide written justification to substantiate the propriety of the markings within the 30-day period(or a longer time not exceeding 90 days approved in writing by the Contracting Officer for good cause shown), the Government shall have the right to cancel or ignore the markings at any time after said period and the data will no longer be made subject to any disclosure prohibitions.

(iii)If the Contractor provides written justification to substantiate the propriety of the markings within the period set

in subdivision (e)(1)(i) of this clause, the Contracting Officer shall consider such written justification and determine whether or not the markings are to be cancelled or ignored. If the Contracting Officer determines that the markings are authorized, the Contractor shall be so notified in writing. If the Contracting Officer determines, with concurrence of the head of the contracting activity, that the markings are not authorized, the Contracting Officer shall furnish the Contractor a written determination, which determination shall become the final agency decision regarding the appropriateness of the markings unless the Contractor files suit in a court of competent jurisdiction within 90 days of receipt of the Contracting Officer's decision. The Government shall continue to abide by the markings under the subdivision (e)(1)(iii) until final resolution of the matter either by the Contracting Officer's determination becoming final (in which instance the Government shall thereafter have the right to cancel or ignore the markings at any time and the data will no longer be made subject to any disclosure prohibitions), or by final disposition of the matter by court decision if suit is filed.

(2) The time limits in the procedures set froth in subparagraph (e)(1) of this clause may be modified in accordance with agency regulations implementing the Freedom of Information Act (5 U.S.C. 552) if necessary to respond to a request thereunder.

(3) This paragraph (e) does not apply if this contract is for a major system or for support of a major system by a civilian agency other than NASA and the U.S. Coast Guard agency subject to the provisions of Title III of the Federal Property and Administrative Services Act of 1949.

(4) Except to the extent that Government's action occurs as the result of final disposition of the matte by a court of competent jurisdiction, the Contract is not precluded by this paragraph (e) from brin-

ging a claim under the Contract Disputes Act, including pursuant to the Disputes clause of this contract, as applicable, that may arise as the result of the Government removing or ignoring authorized markings on data delivered under this contract.

(f) Omitted or incorrect markings.

(1)Data delivered to the Government without either the limited rights, restricted rights, or limited exclusive rights notice as authorized by paragraph (g) of this clause, shall be deemed to have been furnished with unlimited, rights and the Government assumes no liability for the disclosure, use, or reproduction for such data. However, to the extent the data has not been disclosed without restriction outside the Government, the Contractor may request, within 6 months (or longer time approved by the Contracting Officer for good cause shown) after delivery of such data, permission to have notices placed on qualifying data at the Contractor's expense, and the Contracting Officer may agree to do so if the Contractor-

(i) Identifies the data to which the omitted notice is to be applied;

(ii) Demonstrates that the omission of the notice was inadvertent;

(iii) Establishes that the use of the proposed notice is authorized; and

(iv) Acknowledges that the Government has no liability with respect to the disclosure, use, or reproduction of any such data made prior to the addition for the notice or resulting from the omission o the notice.

(2) The Contracting Officer may also(i) permit corrections at the Contractor's expense of incorrect notices of the Contractor identifies the data on which correction of the notice is to be made, and demonstrates that the correct notice is authorized, or (ii) correct any incorrect notices.

(g) Protection of limited rights data, restricted computer software, and limited exclusive rights data.

(1)
When data other that listed in subdivisions (b)(1)(i), (ii), and (iii) of this clause are specified to be delivered under this contract and qualify as either limited rights data or restricted computer software, if the Contractor desires to continue protection of such data, the contractor shall withhold such data and not furnish them to the Government under this contract. As a condition to this withholding, the Contractor shall identify the data being withheld and furnish form, fit and function data in lieu thereof. Limited rights data that are formatted as a computer data base for delivery to the Government are to be treated as limited rights data and not restricted computer software.

(2)
[Reserved]

(3)
[Reserved]

(4)
(i) Notwithstanding any other provisions of this clause, the contract may specify or NASA may require by written request that any data first produced in the performance of this contract be developed to NASA or furnished to others in accordance with (iii)(a) below, and if so specified or required, the Contractor shall affix the following "Limited Exclusive Rights Notice: to data that are identified in this contract as limited exclusive rights data prior to delivery to the Government or prior to release to others by the Contractor:

LIMITED EXCLUSIVE RIGHTS NOTICE
These data are subject to limited exclusive rights under Government contract No....(and subcontract...., if appropriate.) These data may be: used, duplicated, and disclosed by or on behalf of the Government for Government purposed; used, duplicated, and disclosed by or on behalf of the Contractor for its purposed within the United States; and used and duplicated (but not further disclosed) by other recipients that have been designated or approved by NASA as participants in

the program of which this contract is a part for their purposes within the United States, with the express limitation that any release or disclosure for ny of the foregoing purposes are to be made subject to disclosure conditions that protect and preserve its limited exclusive rights. These limited exclusive rights shall be effective until (insert a certain date.) No other disclosure and use of these data is authorized without the written permission of (insert name of contractor of subcontractor.) This Notice shall be marked on any reproduction of these data, in whole or in part.

(End of Notice)

(ii)The Contractor is to place the Limited Exclusive Rights Notice on limited exclusive rights data as soon as practicable after the data is reduced to some tangible, recorded form as defined by the term "data" in this clause, but in any event no later than the earlier of either the date of delivery to NASA if delivery is requested, or of release of the data to others outside of the Contractor's organizational element producing the data. The "date certain" to be inserted in the Notice, indicating the period of limited exclusive rights, shall be 5 years from the date the Notice is placed on the data, unless otherwise agreed to and stated with respect to any item, component, process, or computer software specifically identified in this contract.

(iii)The Contractor agrees:

(a) to make limited exclusive rights data available to any other entity designated or approved by NASA as a participant in the program of which this contract is a part, either as specifically designated in this contract or as subsequently approved and directed in writing by NASA;

(b) obtain written affirmation that any entity receiving limited exclusive rights data pursuant to (a) above will abide by he use, duplication, and disclosure prohibitions of the Limited Exclusive Rights Notice; and

(c) not to authorize any disclosure and use of limited exclusive rights data than as set forth in the Limited Exclusive

Rights Notice without the concurrence of NASA.

(h) Subcontracting.

(1) The Contracting has the responsibility to obtain from its subcontractors all data and rights therein necessary to fulfill the Contractor's obligations to the Government under this contract. If a subcontractor refuses to accept terms affording the Government such rights, the contractor shall promptly bring such refusal to the attention of the Contracting Officer and not proceed with subcontract award without further authorization.

(i) Relationship to patents.

(1) Nothing contained in this clause shall imply a license to the Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Government.

(2) Nothing in this clause shall restrict the rights of the contractor under the New Technology clause of this contract.

(j) Immigrant Aliens

(1) For the purposes of this clause, disclosure of "limited exclusive rights data" to Immigrant Aliens in the course of their employment by the Contractor shall not be interpreted as disclosure outside the United States. An immigrant alien is defined as "any person lawfully admitted in the United States under an immigration visa for permanent residence.

154. 15 C.F.R. § 370 (1992).

155. 22 C.F.R. § 120 (1992).

156. 5 U.S.C.A. § 552 (West 1983).

157. 15 C.F.R. § 799 (1992).

158. 22 C.F.R. § 121 (1992).

159. 22 C.F.R. § 120.10 (1992).

160. 22 C.F.R. § 120.11 (1992).

161. Title 18 of the United States Code.

162. Presentation given at Lewis Research Center, Cleveland, OH. October 16, 1992. The material was presented by Larry H. Brown.

163. 50 U.S.C.A. § 2401 (West 1983). See also 22 U.S.C.A. § 2751 (1992).

164. L.E.R.D. clause; January 16, 1992.

165. The High Speed Research Program, Technology Control Handbook, National Aeronautics and Space Administration, (August 17, 1993).

166. L.E.R.D. clause; January 16, 1992.

167. L.E.R.D. clause; Section (b)(1), January 16, 1992.

168. Id.

169. Id.

170. Id at Section (b)(4).

171. NASA Grants and Cooperative Agreements Handbook, NHB 5800.1B, October 1983.

172. Id at pG-2:1, Section 201(a)(i).

173. Id at Section 201(a)(ii).

174. Id at Section 201 (a)(iii).

175. Id at Section 202.

176. Id at Section 203(3).

177. Id.

178. 35 U.S.C.A. § 200 (West 1983).

179. FAR 52.227-20, May 28, 1993.

180. 35 U.S.C.A. § 102(1983).

181. A University, Small entity or non-profit organization would be fall under the Bayh-Dole Act, therefore they would get the rights to the invention. A Space Act Agreements partner would own the rights if a reimbursable Space Act Agreement is used.

182. Is the point at which the invention can be written down, such that the average person in that field, would be able to build it.

183. 35 U.S.C. § 101(1983).

184. Letter from Nina Lawrence, Associate General Counsel to NASA Installations Patent Counsel (July 5, 1991) (on file with the author).

185. Gottschalk v. Benson, 409 U.S. 63 (1972).

186. Diamond v. Diehr, 450 technology.S. 175(1981).

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13. ABSTRACT (*Maximum 200 words*)

At a fundamental level, intellectual property is the core work product of a technical organization. The National Aeronautics and Space Administration (NASA), produces a variety of intellectual property including: patents, trademarks, data rights, copyright and rights associated with National Security. For a scientific organization to properly manage its work product it has to manage its intellectual property. This paper endeavors to describe how the intellectual property rights are generated and allocated at NASA. The author then goes on to discuss how the intellectual property might be managed to meet the objectives of program implementation, technology transfer and security.

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